A1 Addendum to ALUMON#2 – kokanee Outmigration

A1.1 Addendum Rationale

The first of a series of Alouette Dam pulse flow tests was carried in spring 2009 looking at its effect on out-migrating kokanee smolts. The purpose of this aspect of the monitor is to test the hypothesis that higher flows (1 week period where discharge from Alouette Dam through the spillway gate is increased to 6-9 m³/s from 3 m³/s) would entice more reluctant kokanee to leave the reservoir and hence increase the overall number of out migrating kokanee smolts. This in turn would lead to an increase in the number of return adult sockeye salmon.

The 2009 pulse flow test however, proved unsuccessful due to high flows rendering the rotary screw trap (RST) at Mud Creek inoperable. The RST is the principle means used to measure the number of kokanee out migrants form Alouette Lake reservoir. Attempts to make the RST trap operate at these higher flows proved unsuccessful and highlighted significant safety issues. To test the effect of pulse flow on kokanee outmigration, LGL Ltd Environment Research Associates proposed that two incline plane traps (IPT) be used in addition to the RST and that they be located several hundred meters above the Mud Creek trap site. The proposed trapping arrangement would allow for trapping through a much wider range of flows (though with less efficiency), meet safety requirements and allow for continuity with historical RST data.

A further 2010 pulse flow tested was initiated with proposed use of the two IPT configuration to assess kokanee outmigration during the pulse flow. Unfortunately pre pulse flow evaluation of the IPT system proved unsuccessful with flow in the range of 3 m³/s overwhelming the traps and causing both fish mortality and low capture efficiency.

Given the failure of the IPT arrangement the original single RST monitoring method was reconsidered. It was concluded that through both a more robust anchoring arrangement and increased trap monitoring that the RST would likely be the most successful monitoring technique. Subsequent use of an RST to evaluate the May 2010 pulse flow proved successful with capture of only a single kokanee, however, sufficient capture of non target salmonids allowed confirmation as an effective monitoring approach.

Re-consideration of both lead biologist and technician support requirements over the first three years of program implementation confirmed the requirement for increased labour costs related to the project management, field implementation and reporting components. With project implementation through an LGL Ltd. Environmental Research Associates and Katzie FN partnership the availability of adequate program funding is vital to successful program implementation through 2014.

A BC Hydro Coquitlam River contractor incident in June 2010 related to use of a RST resulted in a Work Safe BC (WSBC) investigation that highlighted deficiencies in BCH’s safety process relating to contractor use of BCH owned RSTs. A subsequent BCH corrective action plan and associated BCH Engineering evaluation confirmed the need for RST and related anchoring system upgrades to ensure compliance with applicable BCH and WSB safety requirements.

Both the above described labour support requirements and fish trap upgrades result in a change in budget to the October 15, 2009 Monitoring Program Terms of Reference.

A1.2 Methods

The kokanee smolt RST sampling and marking strategy employed during the 7 day 6-9 m³/s pulse flow will include:

- Pre-pulse flow (7 day period prior to pulse flow) mark will be a lower caudal clip (LCC) plus adipose chunk to distinguish the pre-pulse flow fish from any fish marked and released prior to the pulse flow that may be holding in the system.
- Pulse flow mark will be LCC again (all fish should have moved out as 7 days will have passed since LCC was used).
- Beginning 3 days before the pulse flow some fish will be held daily for a staggered release over 3 days during the pulse flow. A decision will be made during each of the 3 days as to what proportion to hold for the pulse flow or release the same day as pre-pulse fish.
- Pre-pulse flow held fish will be housed in separate containers in a calm area of the river with the oldest fish released first.
- During the pulse flow the RST will be operated for 12 hour shifts from 6pm to 6am as the vast majority of smolts move at night.
- The RST will be raised and not operated from 6am to 6pm.
- A 3 person crew (for safety) will operate the trap for the 12 hour shift

A1.3 Budget

Total Revised Program Cost: $424,791.00